

THE REPRESENTATIVES OF *SCIRPUS MARITIMUS* IN AMERICA.

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THE bulrush, so abundant in all New England saltmarshes, and characterized by its densely clustered thick brown spikelets and its long moniliform rootstocks with subspherical tubers, has been generally known as *Scirpus maritimus*, L. The species, as it grows upon our eastern coast, presents two marked forms. One, the abundant plant of the New England marshes, has ovate, ovate-oblong or oblong spikelets densely clustered in a head subtended by two or three involucreal leaves. The other, sometimes growing with the dense-headed form and often intergrading with it, is characterized by the somewhat branched inflorescence, elongated rays springing from near the base of the dense central head of spikelets. This form with the branching inflorescence is much less common in New England than is the plant with congested inflorescence, but further south it is common, and it occurs also inland and upon the Pacific coast, as does likewise the plant with dense heads. The two forms of the plant are thus of very broad range in America, but, aside from their habital differences, no characters are found by which they can be separated. In their extremes they are strikingly different, but, with very numerous transitional forms and no perceptible differences in the spikelets and achenes, the two plants can be considered only varieties of one broadly distributed species.

In 1803 Michaux described this American plant, or at least the more branching form, as *Scirpus maritimus*, var. *macrostachyus* ("spicis sessilibus pedunculatisque"), distinguishing it from the European *S. maritimus* by its thicker spikelets ("Spiculæ quam in europæa multo crassiores"). In 1814 Pursh described as a species, *S. robustus*, the large plant ("spicis oblongis, corymbo composito") with the note, "certainly specifically distinct from *S. maritimus*, with which I carefully compared it," and in this species he included the var. *macrostachyus* of Michaux.

Subsequent authors, however, treated the American plant as identical with the European *S. maritimus*, and under that name it was known in America until 1892, when Dr. Britton pointed out that the plant of the eastern saltmarshes differed from *S. maritimus* not only in its thicker spikes but in its achenes, those of the European species

being trigonous, while those of the American *S. robustus* are compressed or lenticular. The achenial character seems a constant one in the American plants examined; and this, together with the thicker spike already emphasized by Michaux and Pursh who must have been familiar with the true *S. maritimus* of Europe, sufficiently distinguishes *S. robustus* of Pursh from the Linnean species with which it has been confused. Some specimens from our Pacific coast are doubtfully referred by Dr. Britton to the true *S. maritimus*, but no mature achenes have been examined, and for the present the status of that species in our flora must remain doubtful,

In the Illustrated Flora Dr. Britton describes as *S. robustus* the plant with spikelets "in a dense, often compound, terminal cluster." This, as already stated, is the commoner form of the plant on our northeastern coast, but the form obviously intended in the descriptions of both Michaux and Pursh is the one with definitely branching inflorescence. In the same work Dr. Britton describes as a species, *S. campestris*, a rather characteristic plant of the Great Plains and Rocky Mountains, with exceedingly light-colored spikelets. Except for the rather inconstant color character, this Great Plain plant does not differ, however, from the dense-headed plant of the coastal region.

In 1899 Professor Aven Nelson published as a species, *Scirpus paludosus*, a Wyoming plant similar to *S. campestris*, Britton, "from which it is clearly separated by its remarkable tubers (subspherical, 10-25 mm. in diameter)," as well as by its darker scales and achenes. Comparison with specimens from Professor Nelson shows that his species is in no way different from the common American plant with brown spikelets in dense terminal heads. Furthermore, *S. paludosus* instead of differing from *S. campestris* in its "remarkable tubers" is very like that plant (as shown by herbarium specimens) in this point—a character likewise shared by the European *S. maritimus* as well as our own *S. robustus*.

In his description of *Scirpus campestris*, Dr. Britton emphasized the pale color of the achenes, but an examination of mature achenes shows them often to be quite as dark as in *S. paludosus* and the larger *S. robustus*. With only the pale color of its spikelets to distinguish it from the common dense-headed form of *S. robustus*, *S. campestris* seems much better treated as a Great Plain variety of that species. The identity of Nelson's *S. paludosus* and the common form with congested

spikelets has already been noted; and that the latter plant, as seen on the eastern coast, is only an extreme form of *S. robustus* is well known to students of our saltmarsh vegetation. We have, then, in America three strong tendencies in *S. robustus*, which may be summarized as follows:

SCIRPUS ROBUSTUS, Pursh. Spikelets brown or ferruginous, oval to oblong, 1.5 to 3 cm. long, 7 to 12 mm. thick, clustered in a subglobose terminal head, and with several elongated rays bearing one to several spikelets; all much exceeded by the 2 or 3 involucreal leaves; achenes from obovate to suborbicular, compressed or lenticular, not angled on the back. — Fl. i. 56; Britton, Trans. N. Y. Acad. Sci. xi. 80, at least as to synonyms. *S. maritimus*, var. *macrostachyus*, Michx. Fl. Bor.-Am. i. 32; Gray, Man. 527. *S. maritimus*, in part, of American authors, not L. — Saltmarshes of the coast, New England to Texas and in alkaline regions of the interior (NEW YORK at Salina, *Clinton*; NEW MEXICO, *C. Wright*, no. 1962, in part, etc.), also on the Pacific coast from WASHINGTON (*Piper*, no. 1008) to CALIFORNIA (*C. Wright*, etc.).

Var. **paludosus**. Spikelets brown or ferruginous, in a dense, rarely compound, head, usually without elongated rays. — *S. paludosus*, Aven Nelson, Bull. Torr. Bot. Cl. xxvi. 5. *S. maritimus*, in part, of American authors, not L. *S. robustus*, Britton in Britton & Brown, Ill. Fl. i. 268, as to descr. and fig. Saltmarshes, abundant on the Atlantic coast from the Gulf of St. Lawrence (?) and New England southward, in the interior at various alkaline stations (Salina, NEW YORK, *Clinton*; SASKATCHEWAN, *Bourgeau*; Cypress Hills, *Macoun*; western DAKOTA, *Leiberg*; Reno Co., KANSAS, *Hitchcock*; Howell Lakes and Seven Mile Lakes, WYOMING, *A. Nelson*, nos. 5312, 6878; Santa Inez Mountains, CALIFORNIA, *Mrs. Cooper*, etc.), and on the Pacific coast (CALIFORNIA, *Hartweg*, etc.).

Var. **campestris**. Similar to the latter, but spikelets straw colored or very pale. — *S. campestris*, Britton in Britton & Brown, Ill. Fl. i. 267. "Manitoba" to Kansas, Nevada, eastern California, and northern Mexico — (Western KANSAS, *Oyster*; NEVADA, Humboldt Sink, *Watson*, no. 1214; ARIZONA, Gila, *Thurber*, no. 687; NEW MEXICO, Rio Laguna, *Marcy Exped.*; CALIFORNIA, Mojave Desert, *Cooper*, no. 2216, *Parish*, no. 1544; SONORA, Horseshoe Bend, 1889, *Palmer*, no. 931).

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